§32. CHS Data Acquisition and Analysis System

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The CHS data acquisition system utilizes two computer systems, namely, the Cinos system and the VAX system. Total amount of experimental data of 160 Gbytes have been acquired this year, which is 20 Mbytes/shot and 2 Gbytes/day in average. This number is larger than that of the last year by 15 %. The 85 % of the total data has been acquired by the Cinos system and the rest by the VAX system. No trouble occurred in the Cinos system throughout the year. While in the VAX system, troubles occurred five times in the magnetic disk and once in the power and terminal device. They are basically because the hardware is getting too old.

The number of unit (eleven) of the Cinos system and their fundamental structures are same as those in the last year. However, minor improvements have been continued. Three new modules are installed on one of the local units, which are used for the AUV spectroscopy. They are two AD/c modules and a Burst clock generator. The AD/c is a CAMAC module with 4-channel, 12 bit, 1 MHz sampling, 128 kbyte memory. The Burst clock generator is a CAMAC TTL level out put module with 6-channel, 10 MHz, and 16 Mega-count. The latter is used for the gate control of the CCD camera detector for the AUV spectrometer.

The shot number has been delivered from the main server computer to all the Cinos units through the local network. Therefore, the shot number transfer sometimes stops due to troubles within in the local network. In order to avoid this situation, a complementary system for the shot number delivery using an image processing is being developed. Since the Cinos system does not have the function of image processing so far, a new image-processing unit is prepared. It is composed of a TV camera, a RGB pedestal controller, a H-V Timing module, Fast 4ch AD/c. they are controlled by one of the Cinos units. Main characteristics of this image-processing unit are as follows. 1) Sampling can be started and terminated at an arbitrary H-positions of the scanning line of the TV camera. 2) Resolution of the video signal can be improved by changing the pedestal level of the signal out put. 3) γ correction for the color sensitivity is skipped, because one of the three color signals with best contrast is chosen automatically in the RGB signal. Those characteristics help to compress data size of the image and enhance the processing speed. Pattern recognition is carried out through the comparison between the acquired image data and the reference image data about the image similarity.

Two new computers are introduced for data analysis. One uses the UNIX operating system and the other uses the VMS operating system. Two computers with different operating systems are necessary because the CHS data acquisition system has two different types of computers, namely, the Cinos system and the VAX system. Each computer has main memory of large capacity and is linked with its own RAID disk and DLT for mass data storage. Accessing old data set stored in these media from the new computers through the network has been successfully tested. After the CHS project is terminated, these new computer systems will be used as the main tools for the data analysis of an arbitrary shot in the past.

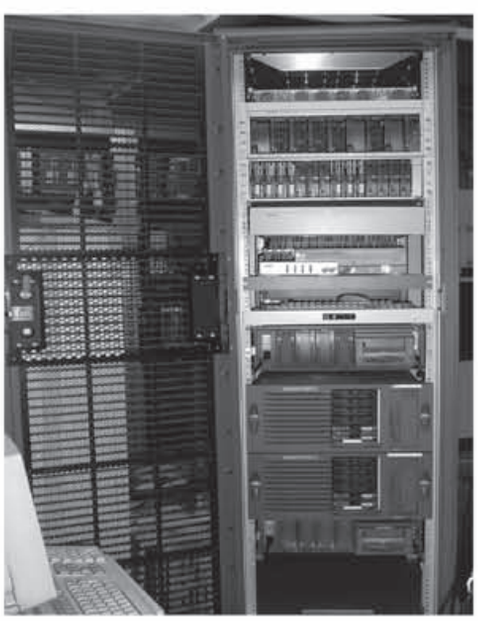

Figure.1. CHS new computer system for the old data analysis and storage system.

Reference:

[1] Takahashi, C. et al., Annual report of NIFS, April 2000-March 2001 298(2001)
[2] Takahashi, C. et al., Annual report of NIFS, April 2001-March 2002 302(2002)
[3] Takahashi, C. et al., Annual report of NIFS, April 2002-March 2003 285(2003)
[4] Takahashi, C. et al., Annual report of NIFS, April 2003-March 2004 297(2004)
[5] Takahashi, C. et al., Annual report of NIFS, April 2004-March 2005 300(2005)